

# Effect of Baby-Friendly Hospital Initiative Breast Feeding Program on Maternity Nurses, Mothers and Infants Outcomes

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**Abstract:** Background: Breastfeeding is an extremely time-sensitive relationship. Experiences with breastfeeding in the first hours and days of life significantly influence an infant's later feeding.

The study aimed to explore the effect of baby-friendly hospital initiative breast feeding program on maternity nurses' mothers and infant outcomes.

**Subjects & methods** a quasi-experimental design was used. The study was conducted at obstetric departments at Shebin – Elkom teaching hospital, Menoufia university hospital and Banha university hospital. A simple random sample of two hundred mothers and 50 maternity nurses were involved in the study. 5 tools were used to collect data.

**Results:** There was statistically significant difference between case and control group regarding mothers' knowledge, attitude regarding breast feeding and practice of sex steps of baby friendly hospital initiative intervention. A significant improvement was observed in nurses' implementation of baby-friendly hospital initiative breast feeding intervention immediately after program implementation.

**Conclusion:** Significant improvement in maternity nurses' implementation of ten steps of baby – friendly hospital initiative intervention after program implementation. Significant improvement in mothers' implementation of six steps of baby – friendly hospital initiative intervention after program implementation.

**Recommendations:** Maternity units should be encouraged to undertake significant strategic and practical changes required to achieve baby friendly hospital initiative standard status

**Keywords:** Baby friendly hospital initiative, Infant, Maternity Nurses, Mothers, Program.

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## I. INTRODUCTION

Breastfeeding is feeding of babies with milk from a female breast. Scientific evidence shows that breast milk is the ideal food for infants, providing numerous benefits for both the infant and the mother. It is well documented that breastfed infants experience significantly lower rates of diabetes, childhood leukemia, necrotizing enterocolitis, and sudden infant death syndrome (American Academy of Pediatrics, 2012). Infants also experience lower incidences of respiratory infections, otitis media, and diarrhea (Ip, Chung, Raman, Trikalinos, & Lau, 2009). Mothers who breastfeed experience a lower risk for breast cancer, ovarian cancer, and type 2 diabetes (Ip et al., 2009). Today, breastfeeding is recognized as the optimal source of nutrition by most professional organizations (United States Department of Agriculture , 2010).

Exclusive breastfeeding is recommended, starting within one hour of birth and for the first 6 months of life, with continued breastfeeding to 2 years of age and beyond. However, rates of initiation, exclusive breastfeeding and breastfeeding duration have fallen since the widespread introduction and promotion of breast-milk substitutes (Willumsen, 2013). According to the most recent data from the Centers for Disease Control and Prevention (CDC), 75% of new mothers initiate breastfeeding, but only 13% of infants are breastfed exclusively for 6 months and only 22% of that

group continues some breastfeeding to 1 year (CDC, 2011). The Healthy People 2020 targets aim to increase these rates to 81.9% initiating breastfeeding, 23.7% breastfeeding exclusively through 6 months, and 34.1% continuing at 1 year (U.S. Department of Health and Human Services, 2010).

Successful breastfeeding depends on a number of factors, including a re-normalization of breastfeeding as the infant feeding method of choice through antenatal counseling and education and breastfeeding support to prevent and resolve breastfeeding difficulties (Willumsen, 2013).

Maternal child nurses have a significant role in helping new mothers establish effective breastfeeding behaviors (Komara et al., 2007). It has been shown that when hospitals institute baby-friendly hospital initiative (BFHI) practices that promote breastfeeding (breastfeeding within 1 hour of birth, exclusive breastfeeding, rooming-in, no pacifiers, and providing mothers with resources for breastfeeding support), the rate of mothers who initially breastfeed and continue breastfeeding increases substantially. A population-based study of Colorado hospitals showed that 68% of mothers who experienced these key practices in the hospital setting were still breastfeeding at 16 weeks versus 53% of mothers who did not (Murray, Ricketts, & Dellaport, 2007).

The baby-friendly hospital initiative (BFHI) was launched in 1991 by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), in response to the 1990 Innocenti Declaration on the promotion, protection and support of breastfeeding. The baby-friendly hospital initiative (BFHI) has been shown to be very effective in increasing breastfeeding initiation, exclusive breastfeeding and breastfeeding duration in many countries, as well as improving mother's health care experiences and reducing rates of infant abandonment (Philip B, Radford, 2006).

Research shows that a baby-friendly hospital designation substantially increases the rates of initial breastfeeding (from 58% to 87%) and increases rates of exclusive breastfeeding, rooming-in, and patient satisfaction (Philipp et al., 2001). Mothers who experienced baby-friendly practices were 13 times more likely to continue breastfeeding than mothers who experienced none (DiGirolamo, Grummer-Strawn, & Fein, 2009).

**Significance of the study:** Breastfeeding is widely viewed as the optimal feeding method for infants among professional nursing and medical organizations. Its health benefits have been comprehensively studied and documented for both infants and mothers. Hospitals and birthing centers can strongly influence the outcomes for mothers who choose to breastfeed by establishing effective breastfeeding behaviors immediately after birth and during the hospital stay. The baby-friendly USA initiative outlines six and ten steps to successful breastfeeding. Although these steps have been successfully supported in practice, they can be difficult to implement due to a variety of factors. Barriers to key baby-friendly steps were overcome through creative approaches and strategic education for staff, physicians, and parents (Lippincott Nursing center, 2012).

**Aim of the study:** The present study aims to explore the effect of baby-friendly hospital initiative breast feeding program on maternity nurses, mothers and infant outcomes.

#### Hypotheses:

- Mothers who received baby-friendly hospital initiative breast feeding program will have higher mean score of knowledge, attitude and reported practice of baby friendly hospital initiative than those in the control group immediately after delivery and after 2 months.
- Infants of mothers who received baby-friendly hospital initiative breast feeding program will complain fewer physical illnesses after they discharged from the hospital than those in the control group.
- Maternity nurses who received baby-friendly hospital initiative breast feeding program will implement baby friendly hospital initiative.

## II. SUBJECTS & METHODS

**Study design:** Quasi-experimental design was used.

#### Study setting:

The study was conducted at obstetric departments at Shebin – Elkom Teaching Hospital, Menoufia University Hospital and Banha University Hospital.

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**Sampling:** a simple random sample of two hundred mothers and 50 maternity nurses were involved in the study.

200 hundred mothers were divided into 2 groups

**Group I (case):** 1 hundred women received baby-friendly hospital initiative breast feeding program.

**Group II (control) :** 1 hundred women received routine hospital care.

### Inclusion criteria:

-Women who were delivered immediately by normal labor without maternal and fetal complications during pregnancy and labor.

- Mother – infant pairs

### Data collection instruments:

Five instruments were used in conducting this study:

**Tool I:** A structured interview questionnaire which included two parts:

Part I: Involved socio-demographic data concerned with the participated mothers included, age, level of education, and occupation.

Part II: Included questions to assess mothers' knowledge about breast feeding.

**Scoring system:** for mother's knowledge, each correct response took 1 score, the wrong response or not known/ done took no score with a total score of 20 represent 100%. Total knowledge score  $\geq 75\%$  considered good, score between 50% – less than 75% considered average, meanwhile mothers' total score less than 50% was considered poor.

**Tool II.** Mothers attitude questionnaire, developed by the researchers to evaluate the mothers attitude toward breast feeding. It includes 12 Items and it divided into 3 score (disagree =1, natural =2and agree = 3) . Total score equal 36. Total attitude score  $\geq 36\%$  considered positive attitude, score less than 36 considered negative attitude.

**Tool III:** Observation checklist to maternity nurses regarding steps of baby-friendly hospital initiative breast feeding intervention which included 10 items answered by done or not done.

**Tool IV:** Observation checklist to breast feed mothers regarding steps of baby-friendly hospital initiative breast feeding intervention which included 6 items answered by done or not done.

**Tool V:** Infant follow-up monitoring sheet, developed by the researchers to assess the infant health history and profile. It includes assessment and recording of occurrence of the physical illness.

### Piloting the instruments:

It was conducted to test feasibility and applicability of the instruments and maneuver of the intervention, it was also used to estimate the time needed to collect the data. It was conducted on a sample of 10% of total sample (20 women and 5 nurses). They were excluded from the main sample. The results of piloting were used to finalize the instruments and schedule the field work time needed. Some changes were made to the data collection instruments according to the opinion of professors and the findings of piloting.

### Study Intervention:

An official permission to conduct the study was obtained from the directors of the obstetric unit at above mentioned settings. After the mothers and nurses accepted to participate in the study and were randomly assigned to either the study or control group, the researchers filled the interview sheet from the mothers who had fulfilling the study criteria. The baseline mothers' knowledge and attitude about breast feeding was assessed. The time spent to fill in the sheet ranged between 30 to 45 minutes for each mother. baby-friendly hospital initiative breast feeding program was given to the study group. Mothers in the study group were divided into 20 groups, each group involve 5 mothers. The researchers taught each group of mothers in a classroom setting. Information and instructions was presented via: a question/answer session; a discussion session; demonstration and re-demonstration; and, printed materials in the form of illustrated Arabic booklet

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prepared by the researchers. It focused on: benefits of breast feeding, how to practice breast feeding successfully. Information about six steps of baby- friendly hospital initiative (BFHI) breast feeding intervention and its effect on infant was given.

### Six steps of baby-friendly hospital initiative (BFHI) breast feeding intervention include:

- Breastfeeding initiation within 1 hour of birth,
- Exclusive breastfeeding while in hospital,
- Rooming-in,
- Breastfeeding on demand,
- No pacifiers or artificial nipples,
- Information on breastfeeding (benefits and management).

Observation of mothers' implementation of six steps of baby friendly breast feeding intervention was done by researcher during implementation of program, using observation check list

Regarding the maternity nurses, maternity nurses were divided to 10 groups each group involved 5 nurses. The researchers taught each group of nurses in a classroom setting. Information and instructions about **ten steps of BFHI breast feeding intervention includes:**

- Have a written breastfeeding policy that is routinely communicated to all health care staff.
- Train health care staff in skills necessary to implement this policy.
- Inform all pregnant women about the benefits and management of breastfeeding.
- Help mothers initiate breastfeeding within a half-hour of birth.
- Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
- Give newborn infants no food or drink other than breast-milk, unless medically indicated.
- Practice rooming-in—allow mothers and infants to remain together—24 hours a day.
- Encourage breastfeeding on demand.
- Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
- Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital

Observation of maternity nurses implementation of ten steps of baby- friendly hospital initiative breast feeding intervention were done by researcher during implementation of program , immediately and 2 months after program implementation using observation check list .

The study was conducted from August to December 2015, Data was collected three days per week.

### Baby-Friendly Hospital Initiative Breast Feeding Program:

The program was designed by the researchers after extensive review of related literature. It consisted of three main parts that included: knowledge about how to practice breast feeding, Educate mothers about six steps of baby – friendly hospital initiative practices and finally educate the nurses about 10 steps of baby – friendly hospital initiative practices. The parts of the program was conducted in 3 phases first during the first stage of delivery collected the knowledge and practice of the mothers about breast feeding and started to give mothers information about importance and six steps of baby friendly hospital initiative breast feeding intervention and discussed with nurses about ten steps of baby friendly hospital initiative breast feeding intervention. The second phase after delivery evaluate the mothers practice of baby friendly hospital initiative breast feeding intervention, knowledge and attitude about breast feeding . Evaluate maternity nurses practice of ten steps of BFHI breast feeding intervention . The third phase after 2 months of delivery assessed the

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impact of BFHI breast feeding intervention on the infant ,and assessed mothers' knowledge and attitude about breast feeding. Finally assessed nurse's sustainability to practice BFHI breast feeding intervention after 2 months of program implementation.

### Outline of guided booklet:

- Definition of breast feeding
- Benefits of breast feeding
- Correct practice of breast feeding
- Importance of baby friendly hospital initiative breast feeding practice
- Items of six steps of baby friendly hospital initiative breast feeding intervention
- Items of ten steps of baby friendly hospital initiative breast feeding intervention

### By the end of educational session, women will be able to:

Knowledge and understanding:

- Determine the benefits of breast feeding.
- Identify correct practice of breast feeding.
- list six steps of baby friendly hospital initiative breast feeding intervention

### Intellectual skills:

- Evaluate importance of six baby friendly hospital initiative breast feeding intervention.

### Professional and practical skills:

- Implement six steps of baby friendly hospital initiative breast feeding intervention correctly.

### General and transferable skills:

Communicate effectively with other women to give advice about good practice of breast feeding.

### By the end of educational session, maternity nurses will be able to:

#### Knowledge and understanding:

- List ten steps of baby friendly hospital initiative breast feeding intervention

#### Intellectual skills:

- Evaluate importance of ten steps of baby friendly hospital initiative breast feeding intervention.

#### Professional and practical skills:

- Implement ten steps of baby friendly hospital initiative breast feeding intervention correctly.

#### General and transferable skills:

Communicate effectively with other maternity nurses to give advice about importance of implementing ten steps of baby friendly hospital initiative breast feeding intervention

### Validity and Reliability:

The study tools were tested for its content validity by group of five experts in the pediatric, obstetric medicine and nursing. The required modifications were carried out accordingly. Then test-retest reliability was applied. The tools proved to be strongly reliable.

### Ethical consideration:

This work was approved by the ethics committee on the Faculty of Medicine and Faculty of Nursing, Menoufia and Benha University. An official written approval was obtained from the Dean of Faculty of Nursing forwarded to the director of above mentioned settings to conduct the study. An informed (oral) consent was obtained from all studied women who met the inclusion criteria after informing them about the purpose and nature of the study. All data collected was strictly confidential and the data would be used for scientific purposes only.

**Statistical analysis:**

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 21, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison between two groups and more was done using Chi-square test ( $\chi^2$ ). T paired test for comparison between more than two means of parametric data,

**III. RESULTS**

**TABLE (1): Percentage distribution of mothers' socio demographic characteristics in the study and control group**

Characteristics	Study Group (n=100)		Control Group (n=100)		X <sup>2</sup>	P
	NO	%	NO	%		
<b>Mothers' age/years:</b>						
- 20-<25	49	49.0	53	53.0	4.96	>0.05
- 25 - <30	28	28.0	25	25.0		
- ≥ 30	23	23.0	22	22.0		
Mean ±SD	25.58 ±4.16		25.79 ±3.89			
<b>Mothers' level of education:</b>						
-Read and write	10	10.0	38	38.0	96.77	<0.001
-Diploma	25	25.0	36	36.0		
Technical institute	41	41.0	18	18.0		
-University education	14	14.0	7	7.0		
<b>Mothers' occupation:</b>						
-Working outside home	42	42.0	21	21.0	19.24	<0.001
- House wife	58	58.0	79	79.0		

Table 1, represented a comparison between study group and control group regarding their socio demographic characteristics. As inferred from the table, the mean age of the women in the study group was 25.58 ±4.16 compared to 25.79 ±3.89 of women in control group. There were statistically significant difference between the two groups regarding level of education, and occupation. Most of women in the study group had intermediate level of education (technical institute) (41%), were house wife (58%) compared to 18 % and 79% respectively in control group.

**TABLE (2) :Total mean score of mothers knowledge in both groups before program implementation and post immediately and at 2<sup>nd</sup> months after program implementation.**

Total Knowledge	Study group n=100						Control group n=100						t-test	P
	Good		Average		Poor		Good		Average		Poor			
	No.	%	No.	%	No.	%	No	%	No	%	No	%		
Pre-test	0	0.0	7	7.0	93	93.0	0	0.0	13	13.0	87	87.0	2.80	>0.05
Mean ± SD	9.14±1.66						8.60±2.33							
Post immediately	86	86.0	14	14.0	0	0.0	8	8.0	15	15.0	77	77.0	23.33	<0.001
Mean ±SD	16.57±1.78						10.33±2.18							
Follow up after 2 month	56	56.0	20	20.0	24	24.0	6	6.0	3	3.0	83	83.0		
Mean ±SD	13.57± 2.84						9.02± 1.99							



Table 2 revealed a statistically significant differences between two groups regarding total mean score of knowledge immediately after program implementation ( post test) and at 2<sup>nd</sup> Months after program implementation (follow-up test) (P<0.001). Meanwhile , there is no statistically significant differences between the two group at pretest ( p>0.05).

**TABLE (3): Total mean score of reported attitude among mothers in both groups before program implementation and post immediately and at 2<sup>nd</sup> months after program implementation**

Total Attitude	Study group n=100				Control group n=100				t-test	P
	Positive		Negative		Positive		Negative			
	No.	%	No.	%	No	%	No	%		
Pre-test	10	10.0	90	90.0	10	10.0	90	90.0	3.377	<0.001
Mean ± SD	18.98±3.80				20.15±2.89					
Post-test Immediately	92	92.0	8	8.0	23	23.0	77	77.0	18.69	<0.001
Mean ±SD	31.83 ±2.16				21.0±5.17					
After 2 Months	55	55.0	45	45.0	5	5.0	95	95.0		
Mean ±SD	27.07±1.97				17.97±2.59				31.71	<0.001

Table 3 revealed a statistically significant difference between two groups regarding total mean score of reported attitude among mothers before Program Implementation(pre-test) and post immediately ( post test) and at 2<sup>nd</sup> Months after program implementation (follow-up test) (P<0.001). As notified from the table, the mean score of reported attitude among mothers in study group at pre- test ,post-test and follow-up test were 18.98±3.80, 31.83 ±2.16and 27.07±1.97compared to 20.15±2.89, 21.0±5.17and 17.97±2.59respectively in control group.

**TABLE( 4) Comparison between mothers in study and control group regarding implementation of six steps of baby friendly hospital initiative breast feeding intervention**

Table 4 showed statistically significant difference between study and control group regarding implementation of six steps

Total Practice	Study group n=100				Control group n=100				t-test	P
	Done		Not done		Done		Not done			
	No.	%	No.	%	No	%	No	%		
Breastfeeding initiation within 1 hour of birth	88	88.0	12	12.0	19	19.0	81	81.0		
Rooming-in.	100	100.0	0	0.0	30	30.0	70	70.0		
Breastfeeding on demand.	86	86.0	14	14.0	43	43.0	57	57.0		
No pacifiers or artificial nipples.	84	84.0	16	16.0	22	22.0	78	78.0		
Exclusive breastfeeding while in hospital,	100	100.0	0	0.0	31	31.0	69	69.0		
Have information on breastfeeding (benefits and management).	94	94.0	6	6.0	41	41.0	59	59.0		
Mean ±SD	5.46 ± .881				1.86 ± 1.52				20.344	<0.001

of baby – friendly hospital initiative breast feeding intervention. Majority of mothers in the study group implemented all items of baby friendly hospital initiative breast feeding intervention after program implementation.

**TABLE (5) Total observation percentage among maternity nurses throughout program phases**

Items	Total observation sheet of Baby-Friendly Hospital Initiative Implementation Tool n = 50				X <sup>2</sup>	P value
	Performed		Not Performed			
	N	%	N	%		
Pre program	6	12.0	44	88.0	91.49	<0.001
Immediately –post	50	100.0	0	0.0		
After two month	39	78.0	11	22.0		

Table 5 showed a significant improvement in nurses implementation of 10 steps of baby-friendly hospital initiative breast feeding intervention immediately after program implementation (post test), As 100 % of nurses were competent performed baby-friendly hospital initiative breast feeding intervention compared to 12% of nurses pre program . The same table also showed that 78% of nurses were competent performed Baby-Friendly Hospital Initiative breast feeding intervention at follow – up test.

**TABLE (6): Comparison between newborn in both Groups according to their weight at delivery and after 2 months**

Weight	Study group	Control group	t-test	P
	Mean ±SD	Mean ±SD		
At Delivery	3.16 ± .311	3.22 ± .447	-1.06	>0.05
After 2 Months	4.90 ± .178	4.16 ± .447	15.27	<0.001

Table 6 shows statistically significant difference in infants weights after 2 months of program implementation as Mean ±SD of study group was 4.90 ± .178 compared to 4.16 ± .447 in control group . meanwhile , there was no statically significant differences between two groups regarding baby weight at delivery.

**TABLE 7 : Comparison between infants in both groups according to their general health condition after 2 months**

Items	Study Group		Control group		X <sup>2</sup>	P
	N	%	N	%		
Feeding Pattern:						
-Exclusive breast feeding	65	65.0	8	8.0	15.94	<0.005
- Breast feeding and artificial formula	35	35.0	44	44.0		
- No breast feeding	0	0.0	48	48.0		
Infants' Health Problems:						
- Diarrhea	7	7.0	20	20.0	36.71	<0.001
- Vomiting	7	7.0	19	19.0		
- respiratory disease	0	0.0	31	31.0		
- Abdominal colic	8	8.0	30	30.0		

Table 7 represented statistically significant differences between study and control group regarding feeding pattern and infant's health problems after 2 months of program implementation. This table illustrated that infants at study group have less health problems than infants at control group mothers ( X<sup>2</sup> 36.71 , P <0.001).

#### IV. DISCUSSION

Breastfeeding is an extremely time-sensitive relationship. Experiences with breastfeeding in the first hours and days of life significantly influence an infant’s later feeding. Because of its inextricable relationship with the birth experience, breastfeeding must be supported throughout the maternity hospital stay, not postponed until the infant goes home (CDC, 2015).

The present study showed statistically significant improvement in mother's knowledge after program implementation than before program implementation. the current study findings was congruent with Casey Rosen et al (2015) who assessed the efficacy of a breastfeeding-friendly quality improvement project in a large federally qualified health center network and observed a statistically significant improvement in mothers knowledge (P < .01) and attitudes (P < .01). These improvements were consistent across employment type, gender, geography, and personal experience.

Barnes et al (2010) who studied evaluation of a Practice-development initiative to improve breastfeeding rates documented that in terms of mothers practices related to the Baby-Friendly Hospital Initiative, post program scores (mean = 42.38, SD = 4.58) were significantly higher than preprogram scores (mean = 37.68, SD = 8.40) (t (186) = -4.840, p = .000). On the same line, Mahjabeen Khan et al (2013) stated that several evidences from developed and developing countries indicate that the BFHI has had a direct impact on breastfeeding practices. In matching with Barnes et al study



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(2010) and Mahjabeen Khan et al study (2013), the current study findings represented statistically significant improvement on mothers breast feeding practices after program implementation than before.

The present study revealed a significant improvement in maternity nurse's implementation of baby-friendly hospital initiative after program implementation. This current study findings was congruent with study conducted by **Centre for Child and Adolescent Health (2011)** which studied the effects of baby friendly Initiative training on breastfeeding rates and the breastfeeding attitudes, knowledge and self-efficacy of community health-care staff and documented that statistically significant improvements in staff breastfeeding attitudes, knowledge and self-efficacy were seen after attending the course.

The current study findings revealed that 65% of mothers in study group were exclusive breast feeding .This consistent with **Barnes et al (2010)** who studied evaluation of a practice-development initiative to improve breastfeeding rates and reported that following the program, prospective breastfeeding data were collected over a 2-month period from 275 mothers. Of this group, 64% were exclusively breastfeeding at hospital discharge, 15.3% were breastfeeding, and 19.3% formula-feeding.

The present study findings revealed decreased incidence of infant problems e.g diarrhea , vomiting , respiratory disease and abdominal colic 7%,7%,0% and 8% respectively. In congruence with current study findings **Ip et al. (2007)** who studied breastfeeding and maternal and infant health outcomes in developed countries found that breastfeeding is associated with a reduction in the risk of acute otitis media, nonspecific gastroenteritis, severe lower respiratory tract infections, atopic dermatitis, asthma, obesity, and diabetes.

### V. CONCLUSION

- Significant improvement in mothers' implementation of six steps of baby – friendly hospital initiative after program implementation.
- Significant improvement in maternity nurses' implementation of ten steps of baby – friendly hospital initiative after program implementation.
- Application of baby – friendly hospital initiative decrease infant exposure to common health problems.

### VI. RECOMMENDATIONS

- Integrate BFHI breast feeding program for hospital administrators in their hospitals to improve child health and survival,
- Maternity units should be encouraged to undertake significant strategic and practical changes required to achieve Baby Friendly Hospital Initiative standard status
- Ante natal Educational program for pregnant women about six steps of BFHI breast feeding intervention at MCH centers

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